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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/617,454	07/17/2000	Walter G. Branco	CY-0015	7824

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EXAMINER
SMETANA, JIRI F

ART UNIT	PAPER NUMBER
1746	2

DATE MAILED: 12/06/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/617,454	BRANCO ET AL.	
	Examiner	Art Unit	
	Jiri F. Smetana	1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2000* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 July 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: 312. Correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

3. Claims 1, 2, 10, 13, and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by Van Autryve et al., U.S. Patent No. 6,014,979.

The claimed invention reads on Van Autryve as follows: Van Autryve discloses a method comprising of cleaning a plasma reactor chamber part, that may have a material redistributed thereon by a reactive plasma process, by placing the chamber part in a redistributed material solvent of acetone (column 11, lines 12-16); and wherein the material includes photoresist polymers (column 8, line 10).

The elements in the claims are read in the reference.

As for claim 10, it is inherent that the etch selectivity between the chamber part and the redistributed material is greater than 1:100 because Van Autryve discloses the same invention.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 3, 5, 7, 9-11, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knapp et al., U.S. Patent No. 4,975,146.

Knapp discloses a method comprising of cleaning a part, that may have a material redistributed thereon by a reactive plasma process, by placing the chamber part in a redistributed material solvent of acetone (column 2, lines 13-16); wherein the part is quartz (column 2, line 4); wherein cleaning the part with a plasma that includes oxygen as a source gas (column 2, lines 17-20); rinsing the part after cleaning with the solvent but before the plasma cleaning (column 2, lines 13-16); and baking the part at a temperature of 80°C (column 2, line 44).

As for claim 10, it is inherent that the etch selectivity between the chamber part and the redistributed material is greater than 1:100 because Knapp discloses that the coating is removed without damaging the underlying surface (the chamber part) (column 2, lines 9-10).

Knapp does not disclose wherein the part cleaned is a reactor chamber part.

It would have been obvious to one of ordinary skill in the art at time the invention was made to clean a reactor chamber part with the method of Knapp because Knapp teaches a general method for removing unwanted material from surfaces exposed to the interior of a plasma etching chamber (column 1, lines 5-9).

6. Claims 1, 2, 5, 7, 8, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roman, U.S. Patent No. 4,334,950.

Roman discloses a method comprising of cleaning a part, that may have a material redistributed thereon by a reactive plasma process, by placing the chamber part in a redistributed material solvent of acetone (column 6, lines 13-15); wherein the material includes photoresist polymers (column 5, line 49); wherein cleaning the part with a plasma that includes oxygen as a source gas (column 6, lines 20-24); rinsing the part after cleaning with the solvent that evaporates at a lower temperature than water but before the plasma cleaning (column 6, lines 19-20); and ultrasonically cleaning the part (column 6, lines 16-17).

Roman does not disclose wherein the part cleaned is a reactor chamber part.

It would have been obvious to one of ordinary skill in the art at time the invention was made to clean a reactor chamber part with the method of Roman because Roman teaches a general method for removing unwanted material from surfaces exposed to the interior of a plasma etching chamber.

7. Claims 1, 2, 4, 5, 7, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiziloglu et al., U.S. Patent No. 6,074,569.

Kiziloglu discloses a method comprising of cleaning a part, that may have a material redistributed thereon by a reactive plasma process, by placing the part in a redistributed material solvent of acetone for 12 hours (column 6, lines 42-44); wherein the material includes photoresist polymers (column 5, line 23-24); wherein cleaning the part with a plasma that includes oxygen as a source gas (column 5, lines 30-35; column 6, lines 45-47); and rinsing the part after cleaning with the solvent but before the plasma cleaning (column 6, lines 42-45).

Kiziloglu does not disclose wherein the part cleaned is a reactor chamber part.

It would have been obvious to one of ordinary skill in the art at time the invention was made to clean a reactor chamber part with the method of Kiziloglu because Kiziloglu teaches a general method for removing unwanted material from surfaces exposed to the interior of a plasma etching chamber.

8. Claims 1, 2, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hira et al., U.S. Patent No. 5,567,333.

Hira discloses a method comprising of cleaning a part, that may have a material redistributed thereon by a reactive plasma process, by placing the part in a redistributed material solvent of acetone (column 25, lines 33); wherein the material includes photoresist polymers (column 25, line 33); and ultrasonically cleaning the part (column 25, lines 36-37).

Hira does not disclose wherein the part cleaned is a reactor chamber part.

It would have been obvious to one of ordinary skill in the art at time the invention was made to clean a reactor chamber part with the method of Hira because Hira teaches a general method for removing unwanted material from surfaces exposed to the interior of a plasma etching chamber.

9. Claims 1, 2, 5, 15, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eidelloth et al., U.S. Patent No. 5,646,095.

Eidelloth discloses a method comprising of cleaning part, that may have a material redistributed thereon by a reactive plasma process, by placing the part in a redistributed material solvent of acetone (column 6, lines 23-30); wherein the material includes photoresist polymers

(column 6, line 23-30); and wherein cleaning the part with a plasma that includes oxygen as a source gas (column 6, lines 23-30).

Eidelloth does not disclose wherein the part cleaned is a reactor chamber part.

It would have been obvious to one of ordinary skill in the art at time the invention was made to clean a reactor chamber part with the method of Eidelloth because Eidelloth teaches a general method for removing unwanted material from surfaces exposed to the interior of a plasma etching chamber.

10. Claims 6, 12, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knapp et al., U.S. Patent No. 4,975,146.

Recitation of Knapp is disclosed here from above.

Knapp does not explicitly disclose wherein the power range of the plasma is 500 to 1000 W or wherein the baking occurs for at least 15 minutes. However, Knapp discloses wherein the power range of the plasma is approximately 400 W.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the plasma with an RF power of between 500 to 1000 W or baking for at least 15 minutes because a slight increase in RF power would increase the rate of cleaning, decrease the length of the process, and improve the cleaning effectiveness. Further, it is to be expected that such a change in fabrication parameters would be an unpatentable modification. Under some circumstances, however, changes such as these may impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art... such ranges are termed critical ranges and the applicant has the burden of proving such criticality... More particularly, where the general

conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. *In re Aller* 105 USPQ 233, 255 (CCPA 1955).See also *In re Waite* 77 USPQ 586 (CCPA 1948); *In re Scherl* 70 USPQ 204 (CCPA 1946); *In re Irmscher* 66 USPQ 314 (CCPA 1945); *In re Norman* 66 USPQ 308 (CCPA 1945); *In re Swenson* 56 USPQ 372 (CCPA 1942); *In re Sola* 25 USPQ 433 (CCPA 1935); *In re Dreyfus* 24 USPQ 52 (CCPA 1934). Further, Knapp teaches that the heating time is dependent upon the amount of coating disposed on the surface of the substrate (column 2, lines 47-50).

11. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roman as applied to claims 1, 2, 5, 7, 8, 15, and 16 above, in view of the admitted prior art.

Recitation of Roman is repeated here from above.

Roman fails to disclose rinsing the chamber part with de-ionized water after applying the organic solvent after applying the organic solvent or ultrasonically cleaning after the oxygen plasma cleaning. However, the admitted prior art discloses rinsing the chamber part with de-ionized water after applying the organic solvent after applying the organic solvent (Figure 5; page 3, lines 14-21).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to rinse the chamber part after applying the organic solvent or ultrasonically cleaning the chamber part after the oxygen plasma cleaning because the admitted prior art teaches a conventional cleaning method of chamber parts. Admissisonas by Applicant can be used as evidence of obviousness. *Ex parte McGaughy* 6 USPQ 2d 1334 (BPAI 1988); *In re Nomiya* 184 USPQ 607 (CCPA 1975). Further, the order of the cleaning steps carries little patentable weight because the transposition of process steps or the splitting of one step into two, where the

processes are substantially identical or equivalent in terms of function, manner and result, was held to be not patentably distinguish the processes. *Ex parte Rubin* 128 USPQ 440 (PTO BdPatApp 1959).

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jiri F. Smetana whose telephone number is (703)605-1173. The examiner can normally be reached on Monday-Friday (7:30am-4:30pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (703)608-4333. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-7718 for regular communications and (703)873-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0661.

Jiri F. Smetana
Patent Examiner
Art Unit 1746

jfs
December 3, 2001

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